

CLAIMS

1. A variable valve mechanism that is capable of changing the operating angle and/or lift amount of a valve body of an internal combustion engine, the variable valve mechanism comprising:

a control shaft whose status is controlled so as to change said operating angle and/or lift amount;

a swinging arm that is positioned between a cam and a valve body to swing in synchronism with cam rotation, thereby transmitting the force of the cam to said valve body;

an adjustment mechanism for changing the basic relative angle of said swinging arm in relation to said valve body in accordance with the status of said control shaft;

temperature detection means for detecting or estimating the ambient temperature of said control shaft and said cam; and

temperature correction means for correcting the status of said control shaft in accordance with said temperature and in order to avoid the influence of the temperature.

2. The variable valve mechanism according to claim 1, further comprising:

a sensor for detecting the status of said control shaft;

an actuator for driving said control shaft; and

actuator control means for controlling a control value of said actuator in accordance with the output of said sensor,

wherein said temperature correction means corrects
5 the control value of said actuator in accordance with said temperature.

3. The variable valve mechanism according to claim 2, wherein said temperature correction means corrects the output of said sensor in accordance with said temperature;
10 and wherein said actuator control means controls the control value of said actuator in accordance with the corrected sensor output.

4. The variable valve mechanism according to claim 1, further comprising:

15 a sensor for detecting the status of said control shaft;

an actuator for driving said control shaft;

target status setup means for setting the target status of said control shaft; and

20 actuator control means for controlling said actuator so that the output of said sensor matches the target status of said control shaft,

wherein said temperature correction means corrects the target status of said control shaft in accordance with
25 said temperature.

5. A variable valve mechanism that is capable of

changing the operating angle and/or lift amount of a valve body of an internal combustion engine, the variable valve mechanism comprising:

a control shaft whose status is controlled so as to
5 change said operating angle and/or lift amount;

an swinging arm that is positioned between a cam and a valve body to oscillate in synchronism with cam rotation, thereby transmitting the force of the cam to said valve body;
and

10 an adjustment mechanism for changing the basic relative angle of said swinging arm in relation to said valve body in accordance with the status of said control shaft,

wherein a member for determining the distance between said control shaft and a camshaft and a member positioned
15 between said control shaft and said cam are made of materials having the same linear expansion coefficient.

6. The variable valve mechanism according to claim 1, wherein said temperature correction means comprising:

a status detection sensor for detecting the status
20 of said control shaft;

stop state temperature acquisition means for acquiring said ambient temperature at the time of an internal combustion engine stop as a stop state temperature;

stop state characteristic value detection means for
25 detecting the operating angle and/or the lift amount at the time of an internal combustion engine stop as a stop state

characteristic value in accordance with the status of said control shaft;

non-corrective restart state characteristic value calculation means for calculating a non-corrective restart state characteristic value in accordance with said stop state characteristic value and the difference between an assumed restart temperature of the internal combustion engine and said stop state temperature;

correction value calculation means for calculating a correction value for converting said non-corrective restart state characteristic value into an operating angle and/or lift amount suitable for said assumed restart temperature; and

pre-startup correction means for correcting the status of said control shaft prior to an internal combustion engine restart so that the operating angle and/or lift amount change in accordance with said correction value.

7. The variable valve mechanism according to claim 6, wherein said pre-startup correction means corrects the status of said control shaft at time of an internal combustion engine stop so that the operating angle and/or lift amount change in accordance with said correction value.

8. The variable valve mechanism according to claim 6 or 7, wherein said assumed restart temperature is the lowest temperature within an operating temperature range of the internal combustion engine.

9. The variable valve mechanism according to claim 1, wherein said temperature correction means comprising:

a status detection sensor for detecting the status of said control shaft;

5 stop state temperature acquisition means for acquiring said ambient temperature at the time of an internal combustion engine stop as a stop state temperature;

stop state characteristic value detection means for detecting the operating angle and/or the lift amount at the
10 time of an internal combustion engine stop as a stop state characteristic value in accordance with the status of said control shaft;

stop period temperature acquisition means for acquiring said ambient temperature during an internal
15 combustion engine stop as a stop period temperature; and

stop period correction means for correcting the status of said control shaft during an internal combustion engine stop so that the operating angle and/or lift amount are maintained suitable for a restart in accordance with
20 said stop state temperature, said stop state characteristic value, and said stop period temperature.

10. The variable valve mechanism according to claim 9, wherein said stop period correction means including:

first characteristic value change amount calculation
25 means for calculating a first characteristic value change amount in accordance with said stop state temperature and

said stop period temperature;

first actual characteristic value calculation means
for calculating the sum of said stop state characteristic
value and said first characteristic value change amount as
5 an actual characteristic value;

suitability judgment means for judging whether the
calculated actual characteristic value is suitable for a
restart;

control shaft correction means, which, when the
10 actual characteristic value is judged to be unsuitable for
a restart, corrects the status of said control shaft so that
the actual characteristic value is suitable for a restart;

post-correction characteristic value calculation
means for calculating a post-correction characteristic
15 value that is obtained by correcting said control shaft;

second characteristic value change amount
calculation means for calculating a second characteristic
value change amount in accordance with a change in said stop
period temperature that is caused after said control shaft
20 is corrected; and

second actual characteristic value calculation means
for calculating the sum of said post-correction
characteristic value and said second characteristic value
change amount as an actual characteristic value.

25 11. The variable valve mechanism according to claim
1, wherein said temperature correction means comprising:

a status detection sensor for detecting the status of said control shaft;

stop state temperature acquisition means for acquiring said ambient temperature at the time of an internal combustion engine stop as a stop state temperature;

stop state characteristic value detection means for detecting the operating angle and/or the lift amount at the time of an internal combustion engine stop as a stop state characteristic value in accordance with the status of said control shaft;

restart request state temperature acquisition means for acquiring said ambient temperature upon a request for an internal combustion engine restart as a restart request state temperature;

non-corrective restart request state characteristic value calculation means for calculating a non-corrective restart request state characteristic value in accordance with said stop state characteristic value and the difference between said restart request state temperature and said stop state temperature;

correction value calculation means for calculating a correction value for converting said non-corrective restart request state characteristic value into a characteristic value suitable for a restart; and

pre-restart correction means for correcting the status of said control shaft prior to an internal combustion

engine restart so that the operating angle and/or lift amount change in accordance with said correction value.

12. The variable valve mechanism according to any one of claims 9 through 11, wherein said internal combustion
5 engine is capable of automatically stopping and starting without requiring an operator intervention.